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USSR AND EASTERN EUROPE SCIENTIFIC ABSTRACTS  
BIOMEDICAL AND BEHAVIORAL SCIENCES

No. 75

This serial publication contains abstracts of articles and news items from USSR and Eastern Europe scientific and technical journals on the specific subjects reflected in the table of contents.

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I. BIOMEDICAL  
Agrotechnology

USSR

UDC 63:551.5

WINDRESISTANCE OF FIELDS IN RELATION TO EMPLOYMENT OF DIFFERENT TECHNOLOGY OF  
CULTIVATION OF CROPS IN THE SOUTHERN FOREST STEPPE ZONE OF OMSKAYA OBLAST

Novosibirsk SIBIRSKIY VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI No 1, Jan/Feb 77  
pp 1-6

GOF, V. F. and KHOLMOV, V. G., candidates of agricultural sciences

[Abstract] Soil-erosion examination of land in the oblast, carried out by the Omsk Agricultural Institute, has indicated that the processes of wind erosion of the soil wreaks great harm to agriculture in the southern forest steppe zone which has involved 300 thousand hectares of eroded earth (29.4% of the arable land). The zone also has 393.6 thousand hectares--38.4%--of lands which, under certain conditions, can turn into the category of eroded earth. With this background, the basic direction of research has been to improve the soil protection system in the steppe areas with their local soil-climate conditions. The authors present data on precipitation (Omsk Steppe Station), dust storms, prevailing weather and crop yields, crop yield as a function of soil processing (deep-plowing, alternation of crops, flat-blade, shallow, no fall-plowing). Soil-clump size varies in relation to moisture at the time of processing, and a more reliable index of soil resistance to erosion is the number of after-harvest residual fragments on the soil surface. The soil of clump structuring, of medium-loamy leached chernozem, in the 0-5 cm layer, under moldboard-plow processing, does not assure reliable protection of the soil from wind erosion. Soil processed with sub-surface flat blade plowing, without turning over the ground, and used to grow wheat, or corn-after-wheat (or wheat-after-corn) as a rule is in a wind-resistant condition, while with sowing after plowing, the soil is moderately wind resistance, and susceptible to erosion. Tables 4; References 9 (Russian).

USSR

UDC 633.11:631.51

TIMES AND METHODS FOR PROCESSING AN ALFALFA LAYER UNDER SPRING WHEAT IN  
CONDITIONS PREVAILING ON THE KRASNOYARSKAYA FOREST STEPPE

Novosibirsk SIBIRSKIY VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 1,  
Jan/Feb 77 pp 6-9

BEKETOV, A. D., candidate of agricultural sciences, and YEDIMEICHEV, YU. F.,  
Krasnoyarsk Agricultural Institute

[Abstract] The authors carried out (1972-1975) field trials of the influence of times and ways of processing of an alfalfa layer, on the productivity of spring wheat on leached, heavy-loamy chernozem; the site of the trials was the Minderlinskoye Teaching Farm of their institute. Four repetitions of the experiment were made, plot size 200 m<sup>2</sup>, order single successive. Soil

moisture, nitrate content, organic residues, weediness, and sprouting of alfalfa were considered. Plowing of the alfalfa early (July) provided more favorable conditions for growth and development of the spring wheat. Yield of spring wheat grown following the alfalfa, in the early periods was 2.4-6.6 centners/hectare higher in every year of the experiment and, after turnover of the layer, 0.5-2.9 c/h. It was found to be necessary to differentiate depth and methods of layer turnover. In wet years it was sufficient to use a plow with a colter at a depth of 20-22 cm, in June, after the first mowing. In dry years, the plowing depth had to be 25-27 cm with soil packing and a preliminary, one-time, pre-tilling disking, and in ordinary, moderately arid years, these same methods of processing, or deep plowing with two-fold pre-tilling disking, had to be used. Table 1; No references.

USSR

UDC 633.11:632.11(571.1)

ASSOCIATION BETWEEN METEOROLOGICAL CONDITIONS AND HARVEST YIELD OF SPRING WHEAT IN CONDITIONS ON THE KULUNDINSKAYA STEPPE ZONE

Novosibirsk SIBIRSKIY VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 1, Jan/Feb 77 pp 16-25

BARSUKOV, A. I., candidate of agricultural sciences, Siberian Scientific Research Institute for Chemization of Agriculture

[Abstract] Winter on the Kulundinskiy steppe is cold, with little snow, strong winds, and snow drifts. The soil freezes through to a depth of 305 cm. Summer is hot, but short, with little precipitation and a low air relative humidity; some summers it reaches a minimum of 8%. This promotes scorching and wind erosion of the soil. The first snow falls in the last ten days of October. A continuous snow cover forms in the first ten or second ten days of November, lasting about 165 days. At the end of February and beginning of March it is no deeper than 18-23 cm. Melting starts about the beginning of March or April, and is over in early April, the melting period being about 25 days, briefer in some years. The author has analyzed 37 years of weather data. In dry conditions on the steppe, there is a correlational association, at a 1% level of significance, between meteorological conditions (precipitation, mean relative and absolute minimum humidity, and mean monthly temperature) and yield of spring wheat, and is significant ( $t_{\text{fact}} > t_{\text{theor}}$ ) with the exception of August precipitation and absolute minimum air humidity ( $t_{\text{fact}} < t_{\text{theor}}$ ). The strongest correlational association appeared between the yield of spring wheat and June-July precipitation (correlation coefficient=0.791); in the other periods this association was less pronounced. Programming of spring wheat yield under Kulunda conditions, can be done with data on the presence of moisture in the soil on the day of sowing and prognosis of the amount of precipitation in June and July. Programming of yield, taking into account expected meteorological conditions in the period of vegetation, reduces to a strict scientific, differentiated, more optimal agrotechnical

procedure for each field. Extensive weather data (referred to the Slavgorod Agrometeorological Station) are presented by the author. Figures 2; Tables 3; References 26 (Russian).

USSR

UDC 633.11:581.1(5/4.11)

MUTUAL DEPENDENCE OF THE ELEMENTS OF THE STRUCTURE OF THE HARVEST YIELD OF VARIOUS SORTS OF SPRING WHEAT UNDER CONDITIONS PREVAILING IN THE TRANSURAL NORTH

Novosibirsk SIBIRSKIY VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 1, Jan/Feb 77 pp 31-36

FARAFONTOV, V. F., candidate of agricultural sciences, and NOVOKHATIN, V. V., Scientific Research Institute of the Agriculture of the Northern Transural Area

[Abstract] The elements of the structure of yield are tabulated; from  $X_1$  to  $X_{10}$  they are: productive business; number of spikelets per spike; number of grains per ear; mass of 1000 kernels, in g; length of stalk, in cm; ratio of kernels to stalk; spike weight, g; spike density; length of ear stem, cm; and, yield per plant, g. The authors' institute has about 100 sorts of soft spring wheat from the collection of VIR (All-Union Scientific Research Institute of Plant Growing). Their work was done in 1972-1974. Under the Transural North conditions, harvest yields of the wheat varied considerably. The best harvests were from Svalef 01320, Rex, Troll, and Strela; all of these were, as a rule, resistant to lodging. Of the elements of structure of the harvest subjected to the most variation (20.7-35.9%) in the set of studied sorts were such traits as  $X_5$ ,  $X_{10}$ ,  $X_3$ ,  $X_1$ ,  $X_8$  and  $X_9$ . Their variability leads to yearly fluctuations in sort yields. The most stable traits were  $X_4$ ,  $X_2$ , and  $X_6$  (variation coefficient 12.7-15.4%). These variation peculiarities must be taken into account in selection of spring wheat for the Transural North. The elements which determine harvest yield are in compound correlational dependence both to each other and to the yield. Considering the mutual dependence of the elements of the structure of the yield and their variation, a highly plastic sort must be created with multiple-spike, well-kerneled spike, and full-weight grain. Of great importance here is the optimal stem thickness and, also, resistance to lodging. Tables 4; References 6 (Russian).

USSR

UDC 633.1:631.52

#### UNIT FOR ACCELERATED CULTIVATION OF PLANTS

Novosibirsk SIBIRSKIY VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 1,  
Jan/Feb 77 pp 37-39

LARIONOV, YU. S., candidate of biological sciences, and ROMANOVSKAYA, R. N.,  
candidate of agricultural sciences. Siberian Branch of the All-Union Institute  
of Plant Growing

[Abstract] A unit, designed by the Institute of Physics, Siberian Department,  
Academy of Sciences USSR, for accelerated cultivation of plants (UVR) has  
undergone two years of testing at the authors' institute. It is set up in a  
heated spot in the institute and has its own power system, lighting, water  
cooling, control, and console with eight lamps of the DKSTV-6000 type, and a  
system of supply of nutrient solution; it has four trays for the substrate.  
The usable area of each of these is 4.7 m<sup>2</sup> (length 3.4, width 1.4, height 0.4 M).  
The trays are placed side by side at a distance of 70 cm for convenience of  
sowing, access to plants, and harvest. Tray filler is agricultural porous  
clay. The clay is regenerated by the AFI method (Yermakov, Ye., 1975). The  
Institute of Physics, SD, AS USSR, based on the experience of the Agrophysical  
Institute of VASKHNIL and its own numerous experiments with different sorts of  
wheat and barley, devised an optimal regimen for accelerated multiplication  
of spring grain cultures under winter conditions (1965-1974). In view of the  
limited area and the pilot-type character of the operations it is still costly;  
growing one plant for two generations costs 0.85 rubel. Decrease in the time  
period for bringing out new sorts--which the unit is designed to do--will  
warrant such outlay. Tables 2; References 4 (Russian).

USSR

UDC 631.331.001

#### STUDY OF THE WORK OF SOWING UNITS AT INCREASED SPEEDS

Novosibirsk SIBIRSKIY VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 1,  
Jan/Feb 77 pp 89-93

IGNATENKO, A. I., candidate of agricultural sciences, Kulunda Agricultural  
Experimental Station

[Abstract] Fast, powerful tractors T-150, T-150K, K-701, and MTZ-80/82 are  
presently assigned to agriculture. Their use in field work helps to sub-  
stantially increase productivity of machine-tractor units (MTA) and to carry  
out work, of fine quality, at the best agrotechnical time periods. Manpower  
needs for such work have been alleviated by one third. By 1980, kolkhoses  
will experience manpower needs such that greater introduction of speedy MTA  
is an obvious requirement of Western Siberian Agriculture. The author has  
examined, over many years, the utilization of various erosion-combatting



machines and equipment at increased speeds of movement in grain-fallow crop rotation. Speedy sowing of wheat Saratovskaya 29 with SZS-9 and SZP-24 sowing machines was studied in laboratory-field trials (at the Siberian Scientific Research Institute of Agriculture) and at industrial farms (Sib. Sci. Res. Inst. Ag., and the Kulunda Agricultural Experimental Station) on the steppe dry rayons of Omskaya Oblast and Altayskiy Kray. At speeds in the range 6-10 km/hr, agronomic and energy use indices did not change. Further increases to 12 km/hr required adjustment in depth of imbedding the seeds by 1.5-2.0 cm and of rates of sowing by 4-5%. The shift to work in the speed range 6-10 km/hr and more increased the productivity of sowing MTA by 40-50% and decreased direct expense and expenditure of labor per hectare of sowing by 30-40%. Tables 4; References 12 (Russian).

USSR

UDC 631.554(571)

RESERVES OF RAISING GROSS YIELD OF GRAIN IN SIBERIA BY REDUCTION OF HARVEST YIELD LOSSES

Novosibirsk SIBIRSKIY VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 1, Jan/Feb 77 pp 100-104

TARASENKO, M. L., Central Siberian Botanical Garden, Siberian Department, Academy of Sciences USSR

[Abstract] The author terms the grain problem as the key to agriculture; its resolution demands, among other things, elimination of losses of yield at harvest time. The first order of business, and the urgency, of research to protect grain when it is being harvested under prevailing conditions in Siberia are established. He notes contributions by Siberian installations on such losses (SibIME, SibNIIESKH, Novosibirsk SKHI, Siberian Branch of VIR, and his institute). Harvesting machines now used don't always correspond to the patterns and biological features of grains, which have been discovered in the last two decades. Fundamentally new improvements in harvesting and yield protection are required. Tables 2; References 12 (Russian).

USSR

UDC 633.2:631.164

#### ECONOMIC ASSESSEMENT OF FODDER PLANTS

Novosibirsk SIBIRSKIY VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 1,  
Jan/Feb 77 pp 105-108

POLULYAK, YU. G., candidate of economic sciences, and SAPELKIN, V. S.,  
Tubinsk Agricultural Experimental Station

[Abstract] The following indices are generally used to evaluate fodder plants: yield from 1 hectare of fodder in nature, fodder units, protein; expenditure of labor and resources calculated per 1 centner of fodder, fodder units, and protein; yield of gross production and of net profit from 1 h of area under fodder culture, and the like. Some authors use the coefficient of effectiveness of the area under fodder culture--the ratio of specific weight of production yield, from the given culture, to the specific weight of the area under this culture. Many investigators try to use a method which takes account of the protein content of the fodder. The authors select protein as a conditional unit for calculation of value, and for the most complete evaluation of fodder plants they use the following indices: yield of protein from 1 hectare (in centners), 1 centner of protein (in rubels), expenditure of labor per 1 centner (man-days), net profit from 1 hectare of area under fodder culture. They also speak of evaluating a fodder for its part in a ration which yields stock production. This concept apparently follows the philosophy of Academician N. P. Fedorenko (1978) to whom they attribute the idea that the worth of each resource ought to be defined as the contribution which it makes in reaching the goals confronting our (Soviet) society. References 3 (Russian).

USSR

UDC 636.085.2

#### ASSESSMENT OF FODDERS OF ONE'S OWN PRODUCTION

Novosibirsk SIBIRSKIY VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 1,  
Jan/Feb 77 pp 108-112

ORLOVA, Z. V., Siberian Scientific Research Institute of the Agricultural Economy

[Abstract] The level of manufacturing cost depends not only on production factors, but, also, to a significant degree, on methods of computation. One of the current problems in cost computation in agricultural production is improvement in evaluation of fodders of one's own production. At present high-grade fodders on different farms are evaluated differently. In the authors' opinion, a unit system of procedures to evaluate fodders of one's own production would make it possible to reflect the additional product created by the fodder in crop husbandry and animal husbandry; this stresses the role of the net cost, and of profit, in the development of production.

Examples of yield of milk and costing are presented for sovkhoses (Katun' and Strostinskiy) in the Biyskiy Rayon of Altayskiy Kray. No references.

USSR

UDC 631.51.(470.31)

#### EFFECTS OF MACHINERY WHEELS ON THE SOIL

Moscow ZEMLEDELIYE in Russian No 2, Feb 77, pp 77-79

POPOV, A. I., deputy head of the Crop Raising Administration, Ministry of Agriculture USSR, NUGIS, E. YU., candidate of technical sciences, and MAKHLAK-SUITS, A. KH., Estonian Scientific Research Institute of Crop Raising and Land Improvement

[Abstract] The use of heavier tractors has increased the problem of soil compaction. An analysis of grain crop tillage indicates that the total area of tractor and equipment tracks amounts to 100-200% of total field area, i.e., every point on the field is run over at least once. In row crops the figure is 150-250%. The resulting increased soil density reduces water permeability and the amount of moisture. Remote sensors were placed in the soil and oscillograms were recorded to determine the pressure increase caused by the K-700 (wheeled) and the T-74 (crawler) tractors. The latter produces quite uneven pressures, the highest being under the two middle rollers. The DT-74 tractor causes soil vibrations in the 25 hertz range, with an amplitude of 1.0 mm at 80 cm, while the T-150K (wheeled) figures are 1.4-1.6 hertz and 0.5 mm. As soil moisture increases, soil is more easily damaged by pressure. Experiments at the Estonian SRI for Crop Raising and Land Improvement indicate that repeated soil compaction reduces grain crop yields anywhere from 4 to 15 quintals per hectare. Drawings and diagrams of vibration patterns are given for the K-700 and T-74, tables present data on soil porosity in relation to pressure, grain crop yields in cases of repeated compaction. Figures 4; Tables 4; References: 0.

USSR

UDC 631.811.98

#### AZOTOBACTERIN IN PLANT GROWING

Moscow ZEMLEDELIYE in Russian No 3, 1977 pp 66-67

PETRUSHENKO, O. P., ZHELNOVA, G. S., and CHEKASINA, YE. V., All-Union Scientific Research Institute of Bacterial Preparations, and PSHENICHNYY, I. P., "Gorki Sovkhoz, Moscow Oblast

[Abstract] Azotobacterin, a plant growth stimulant containing a pure culture of Azotobacter, was developed in a dry form about 6 years ago and tested on a

variety of crops (tomato, corn, beet, cabbage, carrot) grown on about a dozen farms in different parts of the country. The yields of the treated crops were 13 to 36% higher than the controls whether Azotobacterin was applied to seeds or seedlings, although the overall results were best when seedlings were inoculated. The potency of the preparation remains unchanged even after 6 months' storage. The authors recommend large-scale production and wider use of Azotobacterin. Tables 2.

USSR

UDC 631.67(47 + 57)

EXPRESS-METHOD FOR THE DETERMINATION OF THE OPTIMAL MOISTURE OF THE SOIL AND NORMS FOR IRRIGATION

Moscow ZEMLEDELIYA in Russian No 12, Dec 76 pp 55-56

SHEVTESOV, N., All-Union Scientific Institute of the Mechanization and Technology of Irrigation

[Abstract] The Moldavian Institute for Irrigated Crop Raising has developed, and the Elektrotechpribor Plant in Kisinev has mastered, the production of the Dnestr-1 instrument for the determination of the maximum field moisture capacity of the soil (MFMCS) and the depth of soil soaking. It produced good results during testing on an experimental farm and a sovkhos. It can work in nonsaline soils at a temperature ranging from 1 to 50 degrees. The overall working range for determining soil moisture is 60-90% of MFMCS. The error range is  $\pm 5\%$  of moisture content. The instrument (illustrated) consists of a rod probe with a "T" handle connected by wire to meter box. The probe is pushed into the root zone and a reading is given on a microammeter. The exact knowledge of soil moisture content is very useful in making calculations of water requirements. The Dnestr-1 can rapidly and conveniently determine moisture content of the root zone. It works well when soil moisture ranges from 60 to 100% of MFMCS and considerably poorer at lower figures. A table gives irrigation norms for loamy soils in several natural zones. Figure 1; Tables 1; References 0.

USSR

UDC 633.34

SOYA IN KAZAKHSTAN

Moscow ZEMLEDELIYA in Russian No 12, Dec 76 pp 46-47

KARYAGIN, YU., candidate of agricultural sciences, Kazakh Scientific Research Institute of Crop Raising

[Abstract] In 1975 2,700 hectares of soybeans were planted in Kazakhstan. Even in that very dry year some farms in Alma-Atinskaya Oblast' produced

15-20 quintals of soybeans per hectare, and 4 produced 25-30. At the Kazakh SRI of Crop Raising, soya yields over the past 15 years have averaged 32.9 quintals per hectare. The highest yields have been obtained from varieties produced by the institute: Gibridnaya 670-- 37.0 quintals per hectare; Kazakhstanskaya-688-- 28.5 q.p.h. Soybeans are a good predecessor for corn and sugar beets. The soybean-corn for green fodder crop rotation produces 25.9 percent more fodder units and 62.8% more digestible protein than barley-corn rotation; and the soya - barley pattern produces 16.4% more fodder and 146% more digestible protein than the barley-barley rotation. As nodule bacteria are lacking in Kazakhstan's soils it is necessary to apply nitragin. Yields at the Alma-Atinskiy Sovkhoz in Talgarskiy Rayon increased by 44.8% when nitragin was applied. The application of nitrogenous fertilizers suppresses the formation of root nodules, while phosphorous and potassium fertilizers promotes their formation. In order to hinder weed growth 1-3 kilograms of linuron was applied per hectare. If doses exceeded 5 kilograms per hectare there was a reduction in soya field germination rate (by 2-3%). Soil moisture period of germination--bean formation should not be below 80% of the maximum field moisture capacity of soil. It is thus necessary to irrigate two-three times a season (700-800 m<sup>3</sup> per hectare). Tables 1; References 0.

USSR

UDC 632.125(479)

ACHIEVEMENTS OF SCIENCE - AT THE SERVICE OF HARVEST YIELDS: THE CHERNOZEM OF THE PRECAUCASUS - RELIABLE PROTECTION FROM WIND EROSION

Moscow ZEMLEDELIYA in Russian No 12, Dec 76 pp 38-41

TREGUBOV, P., doctor of agricultural sciences, Deputy Director, Soil Institute imeni V. V. Dokuchayev

[Abstract] In carrying out the decisions of a VASKHNIL [All Union Academy of Agricultural Sciences imeni V. I. Lenin] session held in 1969 in Rostov, institutes have done much to protect soils in the Northern Caucasus from wind erosion. If there are no protective measures, wind erosion is greatest in soils where more than half of the particles in the top 5 cm are less than 1 mm. It is best to use diverse tillage equipment: BIG-3 needle harrow, the BDT-7 heavy harrow, and other stubble cleaners and anti erosion devices. The content of particles subject to erosion is only increased about 3% per tillage. Soil conditions were modeled at the Armavirskiy branch of the All-Union Research Institute for the Mechanization of Agriculture (VIM). Maximum damage occurs when there are 40-60 cycles of freezing and thawing. This is similar to actual weather in the region. It is best to have normal germination and tillering of winter grains, to use subsurface tillers for fall plowing, and to plow in the spring where fields have only small amounts of stubble. Fall subsurface tillage keeps 42-50% of the stubble on the surface. In such cases grain yields were 10-12% higher and sunflower yields 5-6% higher. Net income is increased by 1-12% and labor productivity by 10-12%. In dry years it is

best to apply P<sub>90</sub> and P<sub>135</sub>, while in moist years P<sub>45</sub> and P<sub>60</sub> are preferred. Protein content in grain increases by 1-2%, depending on doses of phosphorus fertilizer. The Stavropol Scientific Research Institute for Agriculture has developed a method for subsurface tillage it was used on 220-280 thousand hectares, and 330-510 thousand hectares were strip planted during 1971-1975. However, scientific recommendations are being introduced too slowly, causing great losses. References 0.

USSR

UDC 632.125

#### IN THE STRUGGLE AGAINST SOIL EROSION

Moscow ZEMLEDELIYA in Russian No 12, Dec 76 pp 43-45

UTKIN, D., candidate of agricultural sciences, head, Adamovskiy Support Point, Orenburg Scientific Research Institute of Agriculture, TKACHENKO, P, director, Obil'nyy Sovkhoz, Adamovskiy Rayon, Orenburgskaya Oblast', and ZNOBISHCHEVA, V., Orenburg SRI of Agriculture

[Abstract] Experiments were begun in 1966 on the use of various soil protective measures at the Zarya Kommunizma Sovkhoz. In prior years this farm had suffered wind erosion on 13,000 hectares and grain yields did not exceed 3.5 quintals per hectare, while in some years crops were completely destroyed. Moldboard methods of tillage were replaced by subsurface tillage. The work followed recommendations of the All-Union Scientific Research Institute for Agriculture. In soils of heavy mechanical composition, it is best to work the soil to 25-27 cm only on clean fallow. On the second crop following fallow the depth should be decreased to 10-14 cm, on the third to 20-22 cm, and the fourth again to 10-14 cm. Subsurface tillage should begin with the fallow field. Research was conducted on ways of increasing the effectiveness of clean fallow. The best pattern involved the use of the KPG-250 subsurface tiller and application of superphosphate. Mustard (*Sinapis*) is the best crop for the windbreak strips. It holds snow well. The use of such strips increases spring wheat yields by 5.4 quintals per hectare. The subsurface tillage of strip fallow and application of superphosphate in a four field crop rotation pattern resulted in an additional 9.9 quintals of spring wheat per hectare. On an average during 1967-1975 the moisture content of the top meter of the soil was 82 mm for plowing and 115 mm for subsurface tillage. The use of the subsurface method of tillage resulted in an average 1 quintal per hectare yield increase on one sovkhos and 1.9 on another. Soil resistance to wind erosion was highest when the SZS-2.1 grain drill was used, and the highest when yields were obtained in the experiment variants making use of covering harrowing with the BIG-3 harrow and planting with the SZS-2.1. On fields with light or average weed infestation, tillage should be restricted to early spring harrowing to maintain moisture and to one postplanting cultivation. It is important to limit mechanized tillage to protect the soil and avoid compaction. Figure 1; Table 1; References 0.

## METHODOLOGY FOR THE ECONOMIC SUBSTANTIATION OF CROP ROTATIONS

Moscow ZEMLEDELIYE in Russian No 12, Dec 76 pp 35-37

TKACHEV, V., and TIKHOMIROV, R., Moscow Institute for Land Use Engineers

[Abstract] Crop rotation patterns play an important role in land use. A system for the rational use of agricultural land includes the following: tasks and basic directions in the long range development of agriculture, modelling the basic production operations, measures for intensification, determination of long run productivity of fields and crops, determination of composition of fields, and the development of indicators for the level of economic efficiency of such measures. A flow chart outlines these measures. The efficiency of crop rotation patterns in the Central Economic Region of the RSFSR is evaluated. There are three zones of agricultural specialization here: flax-dairy, produce-dairy, and grain-dairy. Data from experiments of scientific institutions, agricultural schools, and test plots were analyzed in order to determine the influence of predecessors upon the main crops. A point system of crop yields following different predecessors was used. In calculating coefficients, the highest yield was used as the standard. It was necessary to continue studies for two years. The complete measurement of crop rotation efficiency requires more general economic indicators, since it is difficult to find a single indicator. For example, in Smolenskaya Oblast' (flax following perennial grasses and winter grains) a rotation produced the highest gross output, while another (a five field rotation) produced the highest net income. In the index method selected, the standard for all variants is the highest indicator. The data on the zones and crop rotation variants are presented in detail in three large tables. In evaluating crop rotations it is necessary to take specific conditions into consideration, especially on farms where there is a shortage of labor, fodder or fertilizer. Tables 3, References 0.

USSR

UDC 615.332:576.852.1.098.31].015.4:546.858.095.6

RIBONUCLEASE EFFECT OF ACTINOMYCES RIMOSUS ACTING ON THE REPRODUCTION OF CERTAIN VIRUSES

Moscow ANTIBIOTIKI in Russian No 1, Jan 77 signed to press 27 Apr 76 pp 25-28

BATALINA, T. A., LIKHOSHVAY, YE. V., and PENZIKOVA, G. A., Institute of Cytology and Genetics, Siberian Division, Academy of Sciences USSR, Novosibirsk, and All-Union Scientific Research Institute of Antibiotics, Moscow

[Abstract] The antiviral activity of RNA-ase isolated from fermentation broth of *Actinomyces rimosus* was studied. Emphasized was an investigation of how the enzyme affected the multiplication of viruses of vesicular stomatitis, Newcastle disease and variolovaccine disease. The enzyme was found capable of suppressing the multiplication of vesicular stomatitis virus (VSV) in the culture of chick fibroblast cells. The suppression level depended directly on enzyme concentration and decreased with increase in infection multiplicity. No effect was shown by the enzyme on the multiplication of other viruses tested. The RNA-ase was found to decrease the infectivity of freshly isolated virus-containing material in concentrations showing an antiviral effect. Preliminary incubation of cells with the enzyme suppressed plaque formation by the VSV. RNA synthesis in these cultures treated with the RNA-ase was slightly lower. The antiviral effect of RNA-ase was shown to be associated with its enzymic activity. But the RNA-ase had no antiviral effect in experiments with mice infected with VSV. Figures 2; Table 1; References 14: 13 Russian, 1 Western.

USSR

UDC 577.1:612.115

INFLUENCE OF UNSATURATED FATTY ACIDS, VITAMIN A, AND HEPARIN ON INITIAL STAGE OF THROMBIN-<sup>131</sup>I CLEARANCE AND THE FUNCTIONAL STATUS OF THE ANTICOAGULANT SYSTEM OF ANIMALS FOLLOWING DEPRESSION CAUSED BY ATHEROGENIC DIET

Moscow BIOLOGICHESKIYE NAUKI in Russian NO 4, 1977 signed to press 5 May 76 pp 69-74

BAZAZ'YAN, G. G., UL'YANOV, A. M., LYAPINA, L. A., and SYTINA, N. P.

[Abstract] Earlier studies have shown that unsaturated fatty acids, particularly ethyl linoleate administered perorally in combination with vitamin A, go far toward eliminating the negative influence of an atherogenic diet on the functional status of the anticoagulant system of the blood. In this study, experiments were performed on 50 male rats weighing from 250 to 350 g. 36 of the animals were maintained on an atherogenic diet for 7.5 months, during the last 3.5 months of which the animals received 1 ml of ethyl linoleate per os in combination with 400 units of vitamin A and subcutaneous heparin at 100



units per 200 g body weight. It was found that the rats which were maintained performance on an atherogenic diet showed clear depression of the function of the anticoagulant system. The treatment described restores the function of the anticoagulant system in the experimental animals. Administration of ethyl linoleate and vitamin A with chronic subcutaneous administration of heparin intensifies the clearance of thrombin- $^{131}\text{I}$ . Tables 2; References 18: 12 Russian, 6 Western.

USSR

UDC 615.385.34.014.413

#### USE OF DIMETHYLACETAMIDE AS A CRYOPROTECTOR IN GRANULOCYTE FREEZING

Moscow PROBLEMY GEMATOLOGII I PERELIVANIYA KROVI in Russian No 5, May 77  
signed to press 19 Aug 76 pp 50-53

TROSHINA, V. M., ABEZGAUZ, N. N., and LEONTOVICH, V. A., Department of Blood Preservation and Transfusion of the Central Institute of Hematology and Blood Transfusion, Ministry of Health USSR, Moscow

[Abstract] In a search for a new cryoprotector for granulocytes, the effectiveness of dimethylacetamide as a cryoprotector in the freezing of human granulocytes was studied. It is shown that this substance protects these exclusively cryononresistant cells better than does glycerine and even better than dimethylsulfoxide. Its use does not require the introduction of a second cryoprotector into the solution (for example, saccharose which does not penetrate into the cells). Cells frozen in the presence of dimethylacetamide may be transferred into an isotonic medium without preliminary rinsing or dilution. A safeguarding solution is proposed, which provides for a high percentage of preserved cells. References 4: 3 Russian, 1 Western.

USSR

UDC 615.385.014.413

#### CRYOPRESERVATION OF A RED BLOOD CELL PACK RESTORED AFTER PROLONGED STORAGE

Moscow PROBLEMY GEMATOLOGII I PERELIVANIYA KROVI in Russian No 5, May 77  
signed to press 13 Jul 76 pp 45-50

AGRANENKO, V. A., Professor, MELKIKYAN, N. A., and SHCHERBAKOVA, L. N., Department of Blood Preservation and Transfusion (headed by Prof. V. A. Agranenko) of the Central Institute of Hematology and Blood Transfusion, Ministry of Health USSR, Moscow

[Abstract] An attempt is made to prolonged the storage period of erythrocytes, restored after long storage at  $4^{\circ}\text{C}$  by means of carbohydrate-phosphorus

metabolites, via their further cryopreservation. The obtained results manifest a reliable restoration of the level of ATP, 2,3-DPG, and P<sub>50</sub> in the erythrocytes, regardless of the storage period prior to the restoration. With respect to the biochemical indices the restored erythrocytes are not inferior to freshly prepared ones, and with respect to some indices even exceed them. Tables 2; References 12: 2 Russian, 10 Western.

USSR

UDC 577.15.591.8

#### ATP-ASE ACTIVITY OF CANDIDA GUILLIERMONDII BKM Y-42

Yerevan BIOLOGICHESKIY ZHURNAL ARMENII in Russian No 1, Jan 77 signed to press 6 Oct 76 pp 103-104 [This is an abstract. Complete text of the article has been deposited in VINITI]

TUMANYAN, L. R., and DAVTYAN, M. A., Department of Biochemistry and Problem Laboratory of Comparative and Evolutionary Biochemistry, Yerevan State University

[Abstract] Information on the ATP-ase activity of the genus *Candida* is not available in the literature. The available works on yeast ATP-ase activity pertain primarily to the genera *Endomyces* and *Saccharomyces*. Data obtained from an experimental investigation of the ATP-ase activity of the *Candida guilliermondii* BKM Y-42 yeast indicate that the ATP-ase activity of this yeast manifests the basic properties inherent in the mitochondrial ATP-ases of other yeasts. Complete article comprises: Pages 12; Tables 7; References 40.

USSR

UDC 639.31

#### ROLE OF TRACE ELEMENTS IN THE INCREASE OF FISH PRODUCTION UNDER THE CONDITIONS OF ARMENIA

Yerevan BIOLOGICHESKIY ZHURNAL ARMENII in Russian No 1, Jan 77 signed to press 15 Mar 76 pp 91-95

AVETISYAN, L. TS., TsNIRL of the Fish Management Association

[Abstract] Preliminary results of the first season of research (1975) are presented for an investigation, with an intended duration of several years, of the efficacy of using microelements (boron, molybdenum, iodine) as fertilizers for increasing the productivity of fish-breeding ponds under the conditions of Armenia. It was established that the addition of microelements to fertilizers for fish-breeding ponds becomes a supplementary, sufficiently effective means

for the intensification of pond fishbreeding; which promotes a decrease in the consumption of conventional fertilizers and feeds per 1 kg increment of marketable fish. Figures 1; Tables 1; References 16 (Russian).

USSR

UDC 617:615.849.19

RESULTS AND PROSPECTS OF THE USE OF LASERS IN SURGERY

Kiev KLINICHESKAYA KHIRURGIYA in Russian No 4, Apr 77 pp 73-79

KHROMOV, B. M., Professor, Leningrad Order of Lenin Institute for the Advanced Training of Physicians imeni S. M. Kirov

[Abstract] A survey is given of the accomplishments achieved with regard to the use of lasers in surgery, including the potentialities for prospective utilization, the areas about which knowledge is available, and areas where more research should be directed. The extensive bibliography refers principally to sources since 1970. Research in the field is alleged to be held back by a lack of sufficient experimental equipment in the USSR. References 112: 79 Russian, 33 Western.

USSR

UDC 615.832.97:612-083-089

RESECTION OF FROZEN PARENCHYMATOUS ORGANS BY A LASER AND AN ELECTRIC KNIFE

Kiev KLINICHESKAYA KHIRURGIYA in Russian No 4, Apr 77 pp 58-73

POLISHCHUK, YE. I., and GAMALEYA, N. F., Institute of Oncology Problems, Academy of Sciences UkrSSR

[Abstract] The authors propose the resection of parenchymatous organs in accordance with the "freeze-cut" sequence in which freezing precedes the cutting, and is used not, for prevention of the existing bleeding, but for preventive hemostasis in a restricted area of the operated organ. In experimental verification of the method on 189 white rats, it was found that preliminary local freezing promotes an intensification of the hemostatic properties of the "laser scalpel." Further study is required concerning the influence of the rate and depth of freezing upon the amount of blood loss and the degree of damage to the organ operated upon. Tables 1; References 2: 1 Russian, 1 Western.

USSR

UDC 616.13-007.64-092-085.84

USE OF AN ELECTRIC FIELD FOR EXPERIMENTALLY INDUCING THROMBOSES IN VESSELS,  
AND ARTERIAL ANEURISMS

Moscow VOPROSY NEYROKHIRURGII in Russian No 2, 1977 pp 14-17

ORLOV, YU. A., Kiev Scientific Research Institute of Neurosurgery of the  
Ministry of Health UkrSSR, Kiev

[Abstract] Two series of experiments were conducted with canine arteries:  
1) electrothrombosis of arterial vessels, and 2) electrothrombosis of  
artificial arterial aneurisms. Extravascular electrodes were used at 1 v  
and 1 to 2500 microamps. In the first of the series of optimum current was  
2000-2500 microamps; the current density did not appear to influence the rate  
and degree of thrombosis formation. In the second of the series the electro-  
thrombosis of artificial aneurisms promotes obstruction rather promptly, with  
an optimum time of 40-60 minutes at the optimum current (2000-2500 microamps).  
Figures 2; References 26: 9 Russian, 17 Western.

USSR

UDC 632.982.2

LABORATORY TRIALS IN A STUDY OF EFFICIENCY OF ACTION OF HIGHDISPERSION  
INSECTICIDE AEROSOLSNovosibirsk SIBIRSKIY VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 1,  
Jan/Feb 77 pp 42-48

BERDENNIKOVA, S. P., candidate of agricultural sciences, KUTSENOGIY, K. P.,  
candidate of technical sciences, KIROV, YE. I., SAKHAROV, V. M., and  
CHANKINA, O. V., Institute of Chemical Kinetics and Combustion, Siberian  
Department, Academy of Sciences USSR

[Abstract] A considerable bulk of information has been gathered up to this time on practical use of thermomechanical aerosols to combat harmful insects, but the reasons for their high efficiency are still obscure. Attempts to evaluate effectiveness of action of such aerosols of high-density output of toxic chemicals have been difficult, in contrast to dusting or spraying methods. The particles of thermomechanical aerosols have a small dimension (diameter of a drop is about 1 micron), so that very little deposition occurs since these particles remain in a suspended state, practically non-settling. The authors have worked out a method which helped them to evaluate highdispersion insecticide aerosols. An aerosol formed with a pneumatic nozzle with separation of large particles was sprayed into a 1 M<sup>3</sup> cubic chamber. The aerosol was agitated with a fan, after which breeding units with insects were placed in the chamber. After a set time, the units were removed from the chamber. Insects from some of the units were immediately transferred to clean glasses with food; the others were left in the exposed units. Fresh insects and food which had been exposed in the aerosolized chamber was placed into the emptied units taken out of the chamber. All three groups of insects were transferred to a thermostat for observation. The aerosol was tested thrice: immediately after placing the units in the chamber, one hour later, and two days later; this helped to determine change in insecticide in the aerosol state. Insecticides used were DDT, HCCH, and mixtures of them. Acute effects, i.e., action at time of presence in the aerosol, and residual action due to extended contact (day or more) with small insecticide deposits were measured. Effectiveness of action of insecticide residues after use of the aerosol was extremely greater than that of residues after airplane spraying. It was found that the effective dose size in laboratory trials was 1-3 orders higher than under field conditions when a MAG (power aerosol generator) unit was used. Figure 1; Tables 4; References 8: 12 Russian, 4 Western.

USSR

UDC 616-003.96.001.6

EFFECT OF DIFFERENT DURATIONS OF ALPINE ADAPTATION ON THE COURSE OF EXPERIMENTAL  
HETEROTRANSFUSION SHOCK

Frunze ZDRAVOOKHRANENIYE KIRGIZII in Russian No 1, 1977 pp 20-24

TILIS, A. YU., KADYRALIYEV, A. K., and KAZIYEV, A. K., Department of Patho-  
logical Physiology, Kirgiz State Medical Institute

[Abstract] Experiments involving 73 dogs (26 control animals at low altitude) at heights of 2300 m above sea level or at 3200 m above sea level showed that the non-specific resistance of the animals' body to extreme effects increased with the degree of adaptation to hypoxia. At a height of 2300 m, after adaptation of 1 month, dogs showed an improvement in the body reserve capacities and, under this condition, hemorrhagic collapse was milder than that experienced by dogs in a control group. Such a duration of adaptation, however, was clearly insufficient for mobilization of compensation mechanisms at 3200 m. Adaptation of dogs to alpine hypoxia for 2 months led to activation of practically all systems involved in maintaining the oxygen budget of the body. Against such a background, the resistance of the animals to the infusion of heterologous blood increased and symptoms of heterotransfusion shock were relatively mild. No References.

USSR

UDC 616.988.75-022.369

EPIDEMIOLOGICAL CHARACTERISTICS OF ACUTE RESPIRATORY VIRAL INFECTIONS IN  
FAMILIAL FOCI

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 3,  
1977 signed to press 27 Jul 76 pp 124-130

LIDINA, P. V. and MIRONOVSKAYA, A. V., Irkutsk Institute of Epidemiology and  
Microbiology

[Abstract] A systematic study was made over an 18-month period (September 1972 to February 1974) of the incidence of acute respiratory infections in a residential quarter of Irkutsk in which 2500 adults and 900 children dwelt. All those who became sick or had family contact with them were followed up for 3 weeks after the first disease was recorded. A total of 293 cases of influenza, parainfluenza, adenovirus infection, and respiratory syncytial infection were found during the observation period in 183 families numbering 518 members (358 adults and 160 children). The infectiousness of most of the diseases was apparently greater among members of the same family than in closed groups of persons of the same age. The prolonged and close contact of individuals of different ages in families promoted the spread of the infections with clinically pronounced forms in the children. Some of the diseases (parainfluenza and adenovirus infection) frequently occurred in subclinical form, thereby helping to preserve and transmit the causative agents. The type of apartment, floor on which it was located, and number of persons living in it had little effect on the spread of the infections. However, the antibody level was clearly related to the rate of infection, particularly in the children. Tables 5; References 5: 4 Russian, 1 Western.

USSR

UDC 616.36-002.14-022.6-022.363.7:615.47

THE INSTRUMENT FACTOR IN THE TRANSMISSION AND EPIDEMIOLOGY OF SERUM HEPATITIS.  
I. METHODOLOGICAL AND METHODS ASPECTS OF THE SOLUTION TO THE PROBLEM

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 3,  
1977 signed to press 3 Dec 75 pp 114-118

STEPANOV, G. P., Central Institute of Epidemiology, Moscow

[Abstract] The author challenges on scientific and philosophical (dialectical materialistic) grounds the view that serum hepatitis is largely caused by the use of unsterile instruments. The accepted principles of controlled studies, he contends, have been violated. There has been no methodological consistency in the methods used to determine cause-and-effect relations. Selective rather than representative samplings have been used, thereby preventing independent distribution of an observed population by groups and ignoring the need for equivalence of these groups. Impartiality of observation (through coding) on



the part of both investigators and subjects has been lacking. The results were evaluated from extensive rather than intensive indices. To avoid these errors, a methodologically consistent approach to the problem is needed. A controlled prospective study offers the best hope of a solution. References 27: 24 Russian, 3 Western.

USSR

UDC 616.981.49-022.35

ROLE OF THE WATER FACTOR IN SPREADING ACUTE GASTROENTERITIS CAUSED BY SALMONELLAS

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 3, 1977 signed to press 8 Jul 76 pp 15-19

KALINA, G. P., Moscow Institute of Hygiene imeni Erisman

[Abstract] Despite increasingly stringent measures taken by health authorities all over the world to govern the production, transportation, and sale of food, the incidence of salmonellosis is steadily rising. While the food factor is still significant, the weight of evidence implicates water as a major route of transmission of the causative agents, particularly salmonellas of other serotypes than those responsible for typhoid and paratyphoid. The extensive use of water to wash the hands, clothes, dishes, for recreational and sports purposes, etc., has resulted in numerous epidemics of gastroenteritis in the United States, Poland, France, USSR, Argentina, and many Asian and African countries. *S. heidelberg*, *S. enteridis*, and related strains have frequently been isolated from water in places where epidemics have occurred. The pollution of river water receiving household sewage is a prime source of danger because salmonellas are highly resistant even to chlorination. They may survive in treated sewage where 99% of *E. coli* strains have died. References 35: 10 Russian, 25 Western.

"ECOLOGICAL MARKERS" OF ARBOVIRUSES. THE DS-MARKER OF TICK-BORNE  
ENCEPHALITIS VIRUS

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR in Russian No 5, 1977 pp 17-21

CHUNIKHIN, S. P., and DZHIVANYAN, T. I., Institute of Poliomyelitis and Viral  
Encephalites, Academy of Medical Sciences USSR, Moscow

[Text] [Russian abstract provided by the source] As a result of prolonged passage of tick-borne encephalitis virus strains and clones through *H. plumbeum* ticks and mice, the transformation of this virus with respect to the DS-marker (sensitivity to dextran sulfate) and the S-marker (plaque size) was studied. It was shown that the "ricinus" (DS+) and the punctate (S<sup>pt</sup>) variants of this virus can, under experimental conditions, be obtained from the "persulcatus" (DS-) variant. A similar transformation ought to take place in natural foci of tick-borne encephalitis as well. The role of ixodes and vertebrates in this transformation is different: the former promote the appearance of new elements in a strain or clone, while the latter promote their elimination. Figures 3; Tables 1; References 3 (Russian).

USSR

UDC 615.281.8

ANTIVIRAL AND INTERFEROGENIC ACTIVITIES OF SYNTHETIC COMPLEXES OF HOMOPOLY-RIBONUCLEOTIDES AND COMPLEXES OF HOMO- AND HETEROPOLYRIBONUCLEOTIDES

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR in Russian No 5, 1977 pp 64-70

VIL'NER, L. M., BRODSKAYA, L. M., KOGAN, E. M., TIMKOVSKIY, A. L., and SIDOROVA, N. S., Institute of Poliomyelitis and Viral Encephalites, Academy of Medical Sciences USSR, Moscow

[Abstract] In an investigation of the possibility of creating synthetic complexes of homopolyribonucleotides and complexes of homo- and heteropolyribonucleotides in which the advantages are combined, and the drawbacks are leveled off, it is established that a poly (G)·poly (c) polyribonucleotide complex, in comparison to a poly (I)·poly (c) complex, has identically high effectiveness in the case of experimental tick-borne encephalitis of mice and is similar to it with respect to activity in a cell culture of chick embryos, was less active in other cell cultures. These differences were not related to sensitivity to ribonuclease, toxicity, or rate of reaction with the cells, unequally expressed among the complexes. The poly (G, I)·poly (c) homo- and heteropolyribonucleotide complexes turned out to be highly active in all cell systems and, in comparison to the indicated homopolyribonucleotide complexes, induced in the mouse body a much higher formation of interferon and provided for a high survival rate of the animals from tick-borne encephalitis. Figures 1; Tables 6; References 16: 6 Russian, 10 Western.

USSR

UDC 576.858.25.097.24.078.3

IMMUNOLOGICAL ASPECTS IN THE STUDY OF ATTENUATED VIRUS STRAINS OF THE TICK-BORNE ENCEPHALITIS COMPLEX

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR in Russian No 5, 1977 pp 21-28

LEVKOVICH, YE. N., KARPOVICH, L. G., SHARMUKHAMEDOVA, D. A., and MAMONENKO, L. L., Institute of Poliomyelitis and Viral Encephalites, Academy of Medical Sciences USSR, Moscow

[Text] [Russian abstract provided by the source] The antigenic identity of attenuated tick-borne encephalitis (TBE) and Langat virus variatns with their initial parental strains was established by means of a complex of sensitive serological reactions. The immunogenic activity of one of the most attenuated variants of the Langat virus, Tp-21-237, and the dynamics of immunoglobulins IgM and IgG, were studied in experiments on monkeys. Optimum schemes of animal immunization have been developed for the induction of immunity against the TBE virus. Figures 1; Tables 6; References 14: 8 Russian, 6 Western.

USSR

UDC 615.373.39:576.851.551].035.3:617-001

EXPERIENCE WITH DISCONTINUANCE OF THE USE OF TETANUS ANTITOXIN IN INJURIES

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 3, 1977 signed to press 12 May 76 pp 98-101

SERGEYEVA, T. I. and YASTREBOV, V. V., Institute of Epidemiology and Microbiology imeni Gamaleya and Sanitary-Epidemiological Station of Arkhangel'sk Oblast

[Abstract] The use of tetanus antitoxin for the treatment of injuries in regions where tetanus is prevalent was discontinued and replaced by toxoid on a trial basis in Arkhangel'sk Oblast in 1974. Large numbers of people were vaccinated beforehand, particularly those living in areas in which the soil was heavily contaminated by clostridia and individuals working on jobs with a high risk of injury and infection, e. g., agricultural workers, truck drivers, shoe repairmen, metal workers, etc. The administration of toxoid alone to those suffering injuries had no effect on the incidence of tetanus in the oblast. It eliminated all the inconveniences and dangers connected with the use of heterogeneous tetanus antitoxin, prevented allergic reactions, saved the time spent by medical personnel on specific prophylaxis, and made accident victims less reluctant to undergo therapy. Table 1; References 9: 5 Russian, 4 Western.

USSR

UDC 616.981.232-07:616.15-097.5-078.7

GROUP-SPECIFIC ANTIBODIES TO SEROLOGICAL GROUP OF MENINGOCOCCI IN VARIOUS FORMS OF CEREBROSPINAL MENINGITIS

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 3, 1977 signed to press 5 Jul 76 pp 92-97

KOSTYUKOVA, N. N., ZOTOVA, A. B., BABICH, YE. M., ARBEKOVA, V. N., KHAYKINA, B. G., and SYRBU, V. T., Institute of Epidemiology and Microbiology imeni Gamaleya, Academy of Medical Sciences USSR, Kirgiz Institute of Epidemiology and Microbiology, Kharkov Institute of Vaccines and Sera imeni Mechnikov, Novosibirsk Medical Institute, Leningrad Municipal Sanitary-Epidemiological Station, and Moldavian Institute of Hygiene and Epidemiology

[Abstract] Serological examination (passive hemagglutination test) of 2498 persons, including infants with generalized cerebrospinal meningitis, adults and children over 1 year of age with a history of the disease, patients with meningococcic nasopharyngitis, carriers of meningococci, persons who had been in contact with patients, and apparently healthy donors living in areas with different levels of the disease almost always revealed the presence of group-specific antibodies to meningococci in individuals with localized forms of

meningitis (nasopharyngitis, carrier state), but the titers were much lower than in those with the generalized forms. The antibody titers produced in response to the group A meningococcic polysaccharide decreased soon after recovery from either the generalized or localized form of the disease. Consequently, the passive hemagglutination test disclosed cases of fresh infection. Most of the infants less than 1 year old with generalized infection did not have antibodies even in the second or third week of the disease. The authors tentatively conclude that the detection of 10 to 20% of individuals examined who have antibodies to group A meningococci may be a prognostic sign of an impending epidemic. Table 1; References 19: 12 Russian, 7 Western.

USSR

UDC 615.371:576.851.49].065

#### COMPLICATIONS OF VACCINATION AGAINST TYPHOID FEVER

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 3, 1977 signed to press 2 Mar 76 pp 38-41

ZEMSKOV, A. M., Voronezh Medical Institute

[Abstract] The literature on the efficacy of typhoid vaccines is contradictory. The author believes they play only an auxiliary role in the overall effort to control the disease. The immunity they confer is outweighed by their numerous local and systemic side effects, which include malaise, vertigo, anorexia, insomnia, cardiovascular changes, blood dyscrasias, encephalitis, multiple sclerosis, severe allergic reactions, nephropathies, osteomyelitis, and exacerbation of latent pathologies. The author urges continued efforts to: (i) develop an oral vaccine to diminish the intensity of the local and systemic reactions, (ii) free the vaccines from ballast substances, (iii) add to the vaccines graduated quantities of O and Vi antigens, and (iv) use adjuvants to reduce the dose and decrease the number of inoculations. References 48: 31 Russian; 17 Western.

CYTOPATHOGENIC PROPERTIES OF LEPTOSPIRAS IN COW, SWINE, AND GUINEA PIG  
EMBRYONIC KIDNEY CELL CULTURES

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 3,  
1977 signed to press 22 Sep 76 pp 144-145

REYCHUK, YE. A., SOLOSHENKO, I. Z., and CHERNUKHA, YU. G., Institute of  
Epidemiology and Microbiology imeni Gamaleya, Academy of Medical Sciences  
USSR

[Abstract] The purpose of the study was to compare the behavior of 12 strains of pathogenic leptospiaras belonging to 9 variants of the serological groups Pomona, Grippotyphosa, Hebdomadis, and Tarassovi and one form of the saprophytic group Semaranga on the same cellular systems--primarily trypsinized bovine, guinea pig, and swine embryonic cell cultures. The leptospiral strains, which had been stored 3 to 12 years from the time they were isolated from the animals, had an injurious effect (except the saprophytic form) on all the cell cultures that was manifested by destruction of the cell layer and changes in the fibroblast nuclei. The degree of pathogenicity of the leptospiral strains was unrelated to their age. Since the microorganisms did not penetrate within the cells but remained attached to the surface of the fibroblasts, it is conjectured that the cells were injured by the toxic substance produced by the leptospiaras.

USSR

UDC 615.917'413

TOXICITY AND CHARACTER OF ACTION OF SOME HALOGEN DERIVATIVES OF ETHYLENE--  
DIFLUORODICHLOROETHYLENE, TRIFLUOROCHLOROETHYLENE, AND TETRAFLUOROETHYLENE

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 5, 1977  
signed to press 1 Jun 76 pp 36-41

SAKHAROVA, L. N., and TOLGSKAYA, M. S., Institute of Labor Hygiene and Occupational Diseases, Academy of Medical Sciences USSR, Moscow

[Abstract] The title derivatives (DFDCE, TFCE, and TFE) are used in chemical industrial production of plastics and in medicine to produce inhalation anesthetic--ingalan and ftorotan. They are low-boiling, highly volatile agents and are potentially dangerous to production workers; maximum permissible levels (MPL) have not yet been set and the present work has addressed this problem. It was found that, as with the freon series of methane and ethane, toxicity decreases with increase in number of fluorine atoms in the molecule and decrease in number of chlorine atoms. DFDCE, TFCE, and TFE possess a unique quality of action, inducing injury of the nervous system, liver, and kidneys. The MPL of DFDCE is  $1 \text{ mg/m}^3$ , that of TCCE  $5 \text{ mg/m}^3$ , and that recommended for TFE is  $20 \text{ mg/m}^3$ . The use of fluoroolephines demands strict sealing of apparatus, remote control of operations, systematic supervision over the state of the environmental air, and provision of medical examinations. Figures 2; Tables 4; References 13: 8 Russian, 5 Western.

USSR

UDC 616.154.95:665.622.24

CONTENT OF BENZINE IN BLOOD OF WORKERS IN THE RUBBER INDUSTRY

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 5, 1977  
signed to press 11 May 76 pp 50-51

LIPOVSKIY, S. M., YELKIN, V. I., TOMAYEVA, L. V., and ZORINA, V. V., Institute of Obstetrics and Gynecology, Leningrad

[Abstract] To gain insight into mechanisms responsible for bodily changes caused by benzine, the authors have studied benzine blood content in exposed non-pregnant women workers, in women workers at various stages of pregnancy, and in animals subjected to benzine vapors. The benzine blood content was significantly higher in the non-pregnant ( $0.0046 \text{ mg/ml}$ ) than in the pregnant women ( $0.0028 \text{ mg/ml}$ ). This might be explained in that the pregnant women had been rotated to lighter work which avoided immediate contact with benzine; benzine does accumulate in the body. The animal studies revealed that blood content of benzine rises with increases of content in the test chambers. The authors cite conflicting Soviet studies on bodily elimination of benzine (complete vs incomplete) after removal from a benzine atmosphere. Their own

work shows the blood level, in women in direct contact with benzine, and in animals, is a function of its concentration in air at the work place, and the longer one works in a benzine atmosphere the higher the benzine blood level. Tables 2; References 3 (Russian).

USSR

UDC 616.-001.34-057-07:(616.151.5+616.153.962.4

INDICES OF THE BLOOD COAGULATING AND ANTICOAGULATING SYSTEMS IN VICTIMS OF VIBRATION DISEASE CAUSED BY WHOLE-BODY VIBRATION

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 5, 1977 signed to press 13 Jan 76 pp 51-54

VOLKOVA, T. N., KRASAVINA, T. S., and GORNIK, V. M., Central Institute of Expertise on Ability to Work and Organization of the Work of Invalids, Moscow

[Abstract] Vegetative-vascular disturbances play an important role in the chemical picture of vibration disease; the status of coagulation of the blood seems to be involved in this disease and the work of several authors on the effect of local vibrations on blood coagulating properties is cited. The present work deals with the effect of total-body vibration. Workers, aged 40-50, in concrete plants and production of steel-reinforced concrete forms were examined; 30-40% of their working time involved total-body vibration of 50-100 Hz frequency, amplitude of fluctuation 0.05-0.8 mm; term of work 6-10 years. Patients with evoked vibration disease displayed a substantial increase in tolerance of the plasma to heparin, an increase in degree of the thrombotest and in concentration of plasma heparin; in addition they showed a significant rise in content of fibrinogen in the plasma and a lowering of fibrinolytic activity of the plasma (the latter two were unreliable). In general the patients showed activation of blood coagulating properties. Activation of the coagulating system in the presence of some depression of fibrinolytic activity can be viewed as an unfavorable factor indicating depression of the anti-coagulating system. At the same time, the reliable rise in plasma heparin points to activation of compensatory processes in the body directed toward prevention of thrombus formation. The authors make no conclusions about the meaning of the changes in the coagulating and anticoagulating systems of the blood but recommend examination of the coagulogram in order to more precisely diagnose vibration disease and to expand the criteria available to support expertise on work ability. Tables 2; References 6: 5 Russian, 1 Western.



## EXPERIMENTAL STUDY OF INTERMITTENT ACTION OF TOXIC VAPORS

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 5, 1977  
signed to press 10 May 76 pp 27-31

LYUBLINA, YE. I., DOBRYNINA, V. V., and LIVSHITS, R. YE., Institute of Labor Hygiene and Occupational Diseases, Leningrad

[Abstract] Intermittent action of a toxic substance, when there is an initially low accumulation of the substance in the body, has a more serious effect than uninterrupted exposure. Mathematical modelling indicates that with exposure to rats to equal amounts and to the same concentration of a foreign substance, e.g., a toxic vapor, which undergoes slow changes in the rat body, significantly less accumulation takes place with the intermittent action only when the distribution coefficient of the vapor ( $\lambda$ ) between the blood and the air equals 100. The maximum accumulation of xylene in rats which are intermittently exposed--to 2 mg of xylene per liter of air for 3 min, followed by an interval of 3 min without exposure, re-exposure, then relief again, sequentially so that total exposure time is 120 min--is less than that accumulating during continuous exposure. Nevertheless, the body is more adversely affected by the intermittent regime. The authors explain this as follows: the mathematical model considers only the physical aspect of the question while, in the development of habituation, phasic changes of steady accumulation and excretion take place. Thus, in the 3d week of entry into the blood of rats of the intermittent group less xylene is seen than in the non-intermittent group; in the 10th week, the reverse is true: a higher xylene content in the intermittent group than in the non-intermittent group. The action of unusually high temperatures, barometric pressure, noise, currents of high frequency, and electric current during their intermittent action or during severe fluctuations, are more harmful than under uninterrupted continuance of intensity of the toxic factor in the period of its action. In this regard, the effect of breathing of the chemical substance is also involved. The general cause is the aggravating influence of multiple adjustments to the changing conditions. Severe fluctuations in concentration of toxic vapors can be more dangerous than steadier, but higher, concentrations of the vapors. Table 1; References 9: 8 Russian, 1 Western.

USSR

UDC 616.314.13-02.546.16-616.71-003.8)-057:669.713.72

ASSOCIATION OF FLUOROSIS WITH DEGENERATIVE-DYSTROPHIC SKELETAL LESIONS IN  
ELECTROLYSIS SHOP WORKERS IN ALUMINUM PLANTS

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 5, 1977  
signed to press 23 Jun 76 pp 9-13

KUZINA, I. R., Novokuznets, Department of Roentgenology, and Department of  
Occupational Pathology of the Institute for the Advanced Training of  
Physicians

[Abstract] The workers examined were engaged at the Novokuznets Aluminium Plant. One hundred three of 365 (28.2%) workers in the electrolysis shops actually had fluorosis; 50 (13.8%) were suspected to be afflicted with this problem. Degenerative-dystrophic lesions of the skeleton were found in 87.7% of those examined. Combined injuries of the skeleton predominated. A clear-cut association of degenerative-dystrophic damage of the spine and joints with the fluorosis was not revealed. Workers who were not exposed to chronic action of fluorine compounds displayed the lesions in 58.1% of cases. Further, fluorosis apparently did not contribute to lesion formation. Combination of fluorosis and degenerative-dystrophic skeletal lesions is an adverse situation and is mutually aggravating. In many cases pronounced degenerative-dystrophic injuries of the skeleton, in combination with fluorosis, can be a factor in declaring the workers to be invalids. Figures 1; Tables 1; References 10: 8 Russian, 1 Czech, 1 German.

USSR

UDC 613.6-055.2:669.791

PROBLEMS RELATING TO OCCUPATIONAL HYGIENE OF WOMEN IN MERCURY PRODUCTION

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 5,  
1977 signed to press 17 May 76 pp 17-20

GONCHARUK, G. A., Kiev Medical Institute

[Abstract] Literature reports on the effect of mercury and its compounds on feminine sexual and child-bearing functioning concern mostly levels of the agent which exceed maximum permissible levels (MPL). The present article reports a study on labor conditions and their effect on general and gynecological disease and childbearing function of female workers under the conditions in modern mercury production. That is, where concentrations closely approach the MPL. Women in this industry work at preparation of mercury ores for roasting, in departments for preparation of highest quality mercury, in transport and processing of cinders, in laboratories, in sections for purification of gases, and purification of water in housing quarters. In all areas, mercury vapors are found, originating in the gases and contaminated grounds, equipment, and clothing. Air concentrations of working areas range

from traces to 0.08 mg/m<sup>3</sup>. Per 100 year-round workers, 84.4 incidences in men and 106.8 incidences in women of incapacitation (1605.5 and 876.1 days, respectively) were recorded. Complaints among women are high disease-incidence with temporary disability, menstrual disturbance, and increased percentage of complications in pregnancy and delivery. Improvement of working conditions will require control of mercury levels, reduction of secondary sources of contamination, and transfer of pregnant women to other jobs. Tables 3; References 4 (Russian).

USSR

UDC 613.62:613.99:665.6

WORKING CONDITIONS AND HEALTH STATUS OF WOMEN EMPLOYEES OF THE VLADIMIR  
IL'ICH OIL REFINERY IN NOVO-BAKU

Baku AZERBAYDZHANSKIY MEDITSINSKIY ZHURNAL in Russian No 2, 1977 pp 56-60

MELIKZADE, T. M., BASHIRZADE, A. A., KERIMOVA, N. I., YELISUYSKAYA, R. V., NABIYEVA, SH. D., FEL', A. I., and AMRAKHOVA, M. M., Azerbaydzhan Scientific Research Institute of Industrial Hygiene and Occupational Diseases imeni M. M. Efendizade

[Abstract] Workers in the Novo-Baku oil refinery are exposed to a variety of occupational hazards: fumes of hydrocarbons occasionally above maximum permissible concentrations, sulfuric acid and ammonia fumes, aluminosilicate dust, high noise levels, and adverse weather factors because most of the equipment is outdoors. Physiological studies revealed a decrease in muscular strength and endurance, a lengthening of the latent periods of visual and auditory reflexes, and increased blood pressure and pulse rate by the end of a regular shift particularly in women with more than 5 years' work experience. Histochemical analysis of blood cholinesterase and 17-hydroxycorticosteroids, epinephrine, and norepinephrine in urine showed abnormal values, the levels varying with the length of time on the job and the nature of the job. The incidence of gynecological diseases--chronic inflammation of the uterine appendages, ovarian dysfunction, and cervical erosion--mostly among women over 40 was significantly higher than in the controls. Immunological tests revealed some impairment of the protective function of the skin and mucosa. No references.

USSR

UDC 577.15.591.8

INHIBITION AND STABILIZATION OF ASPARAGINASE IN CANDIDA GUILLERMONDII BKM U-42 YEAST

Yerevan BIOLOGICHESKIY ZHURNAL ARMENII in Armenian Vol 30, No 3, Mar 77  
signed to press 8 Jul 76 pp 38-45

STEPANYAN, K. R., ORGANESYAN, S. P., and DAVTYAN, M. A., Department of Biochemistry and Problem Laboratory of Comparative and Evolutionary Biochemistry, Yerevan State University

[Abstract] The antileucotic activity of asparaginase accounts for the intense study devoted to this enzyme. Yeast asparaginase has received much less attention. In their studies of asparaginase in yeast, the authors have already found (1975) that the title yeast has considerable asparaginase activity exceeding that of glutaminase by a factor of 10-15. It is soluble and has an optimum pH of 8.5-9.5. The present article deals with its stability to ions and the significance of SH-groups for its activity. Cu, Co, Zn, Mn, and Fe ions, PCMB, and K, Na, and Mg ions inhibit the asparaginase activity of *C. guilliermondii* BKM U-42 yeast. The degree of inhibition is a factor of the concentration of these ions and the time of their contact with the enzyme. When asparaginase is previously incubated with cysteine, the inhibiting action of PCMB is prevented; aspartate under the same conditions does not manifest this protective action. L.-asparagine lowers the inhibiting effect of PCMB. Cysteine, glutathione, and aspartate stabilize the activity of the enzyme during storage. SH-groups are, therefore, believed to be present in the active center of the enzyme and account for the manifestation of asparaginase activity. Tables 7; References 23: 9 Russian, 14 Western.

USSR

UDC 615.332 (No 792)

NEW ANTIBIOTIC NO 792 FORMED BY ACTINOMYCES BOTTROPENSIS

Moscow ANTIBIOTIKI in Russian No 1, Jan 77 pp 3-7 signed to press 28 Jul 76

FEDOROVA, G. B., LAVROVA, M. F., LOMAKINA, N. N., TEREKHOVA, L. P., IVANITSKAYA, L. P., and MAKUKHO, L. V., Institute on Research of New Antibiotics, Academy of Medical Sciences USSR, Moscow

[Abstract] An actinomycetes strain No 792, which produces a new antibiotic, was isolated as part of an antitumor antibiotic screening program. By its morphological and cultural properties, strain No 792 was classified as derived from the species *Actinomyces bottropensis*. The antibiotic was recovered from the culture fluid of the strain by extraction as a crystalline orange substance,  $\lambda_{\max}$  235, 305, 410 nm ( $E_{1\%}^{1\text{cm}}$  735, 150, 168), m.p. 232-255° (dec),

molecular weight 340, C 67 percent, H 4.8 percent, no nitrogen, sulfur or halogen. The antibiotic was inactivated in alkaline solutions; this treatment formed a barely soluble compound, crystallizing as red needles,  $\lambda_{\max}$  256, 485 nm ( $E_{1\%}^{1\text{cm}}$  800, 195), m.p. 202-204° (dec), molecular weight 320, C 69.5 percent, <sup>1st</sup> and H 4.7 percent. Antibiotic No 792 exhibited antitumor and antimicrobial activity. Figures 3; Tables 2; References 20: 3 Russian, 17 Western.

USSR

UDC 576.852.24

#### RESIDUAL MICROFLORA IN PASTEURIZED ALMALYK DAIRY MILK AND SEASONAL CHANGES THEREIN

Tashkent UZBEKSKIY BIOLOGICHESKIY ZHURNAL in Russian No 1, 1977 signed to press 21 Dec 75 pp 12-14

KHAKIMOVA, SH. I., LI, A. A., and MUSAYEV, SH. M., Microbiology Department, Academy of Sciences Uzbek SSR

[Abstract] Analysis of raw and pasteurized Almalyk Dairy milk showed that the number of bacteria in raw milk exhibited seasonal changes, ranging from 1.5 million in winter to 200 million in summer, whereas the bacterial content of pasteurized milk did not vary from season to season (a few hundred to several tens of thousands). No seasonal differences were detected in the qualitative composition of the microflora in either the raw or the pasteurized milk. Most of the organisms were thermostable lactate bacteria (chiefly streptococci). Foreign microflora included bacteria of the genus *Pseudomonas* and *Bacterium*, yeasts, and a few fungi. The bacteria of the intestinal group did not withstand the pasteurization temperature. The ratio of thermostable lactate bacteria to the foreign microflora in the pasteurized milk was 99:1.

USSR

UDC 576.851.48.097.29

#### ENTEROTOXIGENIC E. COLI

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 3, 1977 signed to press 11 Mar 76 pp 31-38

TABACHNIK, A. L., GIRSHOVICH, YE. S., and TEMPER, R. M., Moscow Institute of Vaccines and Sera imeni Mechnikov

[Abstract] The available evidence suggests that enterotoxigenic *E. coli* strains may be responsible for many intestinal disorders, e.g., tropical

sprue, traveler's diarrhea, and some acute intestinal diseases in children. The article reviews the Soviet and foreign literatures on the role of these strains in the etiology of unidentified diarrheas, genetic control of the synthesis of enterotoxins, their physicochemical and antigenic properties, mechanism of action, and the various experimental models used to detect *E. coli* enterotoxins in vivo and in vitro. References 67: 7 Russian, 60 Western.

USSR

UDC 617-001.17-022.7 (Bact. pyocyanea)

#### INFECTION OF BURN WOUNDS WITH *PSEUDOMONAS AERUGINOSA*

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 3, 1977 signed to press 11 May 76 pp 52-56

KOLKER, I. I., GRISHINA, I. A., AKATOVA, N. S., SMIRNOVA, N. YE., PANOVA, YU. M., and MINKOVA, G. L., Institute of Surgery imeni Vishnevskiy, Academy of Medical Sciences USSR, and State Institute for Standardization and Control of Biologicals imeni Tarasevich

[Abstract] Bacteriological examination of smears from the wounds of 302 burn patients treated in the All-Union Burn Center in 1970-1975 revealed a substantial increase in recent years in the rate of isolation of *Pseudomonas aeruginosa* from the wounds and discharges and the existence of a direct relationship between the severity of the lesions and frequency of isolation of *P. aeruginosa*. Whereas prior to 1970 it was isolated from wounds in approximately 20% of cases, it is now isolated in almost half (44.7%). A statistically significant difference was observed between the rate of isolation of *P. aeruginosa* from deep wounds covering 10% of more of the body surface. It clearly tends to increase with increasing size of the area affected. Almost 90% of the cultures isolated were typed by means of 17 agglutinating sera. Over 70% of the typed cultures belonged to serological group II, the others to serotype 011 and serological groups IV and I. Tables 2; References 14: 5 Russian, 9 Western.

USSR

UDC 616.981.452/.455-031:611.24+616.24-002.71]-091.9-07

EXPERIMENTAL STUDY OF PULMONARY FORMS OF PLAGUE, TULAREMIA, AND PSEUDOTUBERCULOSIS

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 3, 1977 signed to press 28 Jun 76 pp 110-114

SAMOYLOVA, L. V., VASENIN, A. S., PIONTKOVSKIY, S. A., and PLOTNIKOVA, YE. A., All-Union "Microbe" Plague Institute, Saratov

[Abstract] During the first 12 hours following aerosol infection of guinea pigs with the causative agents of plague, tularemia, and pseudotuberculosis, the number of bacteria in the lungs decreased substantially due to their elimination by the blood vessels and lymphatics. Bacterial reproduction began between 12 and 24 hours after infection with plague and pseudotuberculosis and between 24 and 48 hours after infection with tularemia. Generalization of the infection and resulting septicemia began on day 1 or 2 in the case of plague and tularemia and on day 4 or 5 in the case of pseudotuberculosis. The ensuing intoxication led to impairment of viral functions and development of endotoxic shock. The animals died of plague or tularemia between days 3 and 5 and of pseudotuberculosis between days 7 and 10. Tens of billions of bacteria were found at this time in 1 g of lung and tens of millions in 1 g of other internal organs. Table 1; References 26: 16 Russian, 10 Western.

USSR

UDC 576.858.25.001.33

STUDY OF THE PHYSICOCHEMICAL PROPERTIES, THE MORPHOLOGY, AND THE MORPHOGENESIS OF ARBOVIRUSES OF THE CHF-CONGO GROUP WITH THE AIM OF DETERMINING THE TAXONOMIC POSITION OF THESE AGENTS IN THE SYSTEM OF MODERN CLASSIFICATION

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR in Russian No 5, 1977 pp 28-35

DONETS, M. A., KOROLEV, M. B., and CHUMAKOV, M. P., Institute of Poliomyelitis and Viral Encephalites, AMS USSR, Moscow

[Abstract] The causative agent of Crimean hemorrhagic fever (CHF) has been found to be antigenically closely related to the Congo virus, and with it forms the CHF-Congo group. Characteristics which permit a place for these agents to be determined in the system of contemporary taxonomy are virtually absent for the CHF-Congo group. A generalization of the authors' research data in the study of this question is presented. It is found that the studied taxonomic criteria CHF-Congo arbovirus group (the physicochemical properties, the morphology, and the morphogenesis) have permitted these agents to be classified as viruses of the Bunyaviridae family, and to be differentiated from members of the other taxa of the universal classification. Figures 5; References 25: 9 Russian, 25 Western.

USSR

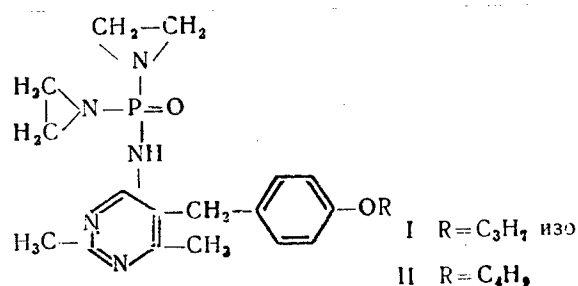
UDC 616-08-006

## TOXICITY AND ANTITUMOR ACTIVITY OF TWO COMPOUNDS FROM A GROUP OF DIETHYLENE-IMIDES OF ALKOXYBENZYL-PYRIMIDYLAMIDOPHOSPHORIC ACIDS

Yerevan BIOLOGICHESKIY ZHURNAL ARMENII in Armenian Vol 30, No 3, Mar 77 signed to press 28 Dec 76 pp 46-52

STEPANYAN, G. M., and GARIBZHANYAN, B. T., Institute of Fine Organic Chemistry imeni A. L. Midzhoyan, Academy of Sciences ArmSSR

[Abstract] The interest of the authors was in a detailed study of the toxic and antitumor properties of 2,4-dimethyl-5-(p-isopropoxybenzyl)- and 5-(p-butoxybenzyl)-pyrimidyl-6-amidophosphoric acids (compounds I and II):



Using fosfemid (Chernov, 1963) as an index, both compounds are less toxic than that of antitumor preparation. I is more toxic than II, which may be due to the iso-alkoxy group in its molecule since analogous compounds which contain such a radical on the pyrimidyl ring are more toxic, in the majority of cases, than their analogs with a normal carbon chain. They are less cumulative than fosfemid. II is less cumulative than I in the body. In all cases, death of the animals from toxic doses occurred 1-5 days after administration. In this period the animals developed a general depression, loss of appetite, dishevelled skin, slow and difficult movement, i.e., the characteristic symptoms of poisoning by ethyleneimine antitumor agents. I and II manifest expressed antitumor activity. In this respect they not only do not yield in effectiveness to fosfemid, they even differ favorably from it in chemotherapeutic index. They do differ somewhat from fosfemid in spectrum of action, being inactive against ascitic tumors. A negative aspect of these compounds might be the significant lowering of their antitumor effectiveness with peroral use; they are insoluble in water. Tables 4; References 20: 19 Russian, 1 Western.



USSR

UDC 581.15

STUDY OF THE ACTION OF NEW DERIVATIVES OF HYDROXYLAMINE

Yerevan BIOLOGICHESKIY ZHURNAL ARMENII in Armenian Vol 30, No 3, Mar 77 signed to press 16 Jul 76 pp 66-70

GALUKYAN, M. G., and MOVSESYAN, S. N.

[Text-Russian language abstract supplied by authors] The purpose of this research was to study the mutagenic effectiveness of new preparations of hydroxylamine derivatives (preparations 314 and 2055) synthesized at the ITOKh (Institute of Fine Organic Chemistry), Academy of Sciences, ArmSSR. On the basis of study of chromosome disruptions in mitotic and meiotic division in two, genotypically-sharply-differing plants, the mutagenic effect of the new hydroxylamine derivatives (314 and 2055) was revealed. The results herein showed that there is no definite relationship between the tested concentrations of these compounds and the frequency of chromosome reorganization either in the microspore or in the meristematic cells that is characteristic of chemical mutagens. The tested compounds which are characterized by mutagen action equal or exceed, at certain concentrations, the action of the starting mutagen hydroxylamine. Figure 1; Tables 2; References 5 (Russian).

USSR

UDC 615.332(Magnamycinum)].017:615.277.3

ANTITUMOR ACTIVITY OF CARMINOMYCIN COMPLEX CONSTITUENTS

Moscow ANTIBIOTIKI in Russian No 1, Jan 77 signed to press 26 Feb 76 pp 69-74

SHORIN, V. A., deceased, BAZHANOV, V. S., and AVERBUKH, L. A., Institute for the Search for New Antibiotics, Academy of Medical Sciences USSR, Moscow

[Abstract] Antitumor activity of carminomycin complex constituents was studied with respect to eight strains of transplantable mouse tumors: lymphosarcoma L10-1, prestomach cancer OZh-5, sarcoma 180, lymphoid leucosis L 1210, lung bronchogenic cancer RL, lymphodenoiss NK/Li, Ehrlich carcinoma and Garding-Passy melanoma. It was shown that constituents I, II and III exhibit nearly the same high antitumor activity, and the same optimal administration dosage scheme should be used for them. The scheme consisted of twofold administration of the drug at 96-120 hr intervals. Constituent I shows broader therapeutic ranges and is more active against lung blastoma effect on the ascitic form of Ehrlich carcinoma. A comparative study of the constituent toxicity and pharmacology is required for a final conclusion on recommending one of the constituents for clinical trials. Tables 5; References 11 (Russian).

## ANTITUMOR ACTIVITY OF L-ASPARAGINASE FROM E. COLI AND ERW. CAROTOVORA

Moscow ANTIBIOTIKI in Russian No 1, Jan 77 signed to press 28 Jul 76 pp 78-81

TERENT'YEVA, T. G., SOKOLOV, A. B., and NAVASHIN, S. M., Laboratory of Experimental Chemotherapy (director: I. P. Fomina), All-Union Scientific Research Institute of Antibiotics, Moscow

[Abstract] The specific activity of l-asparaginase was studied on three strains of mouse leucosis: lymphosarcoma LI0-1, hemocytoblastosis La and lymphadenosis L-5178 (Fisher) and on ascitic Walker rat carcinosarcoma. LI0-1 lymphosarcoma was transplanted to nonpedigree white mice by administering parenterally 0.2 ml of a suspension of tumor cells in an isotonic sodium chloride solution. Lymphadenosis L-5178 was implanted in nonpedigree white mice parenterally with an injection of  $5 \cdot 10^6$  tumor cells. The ascitic Walker carcinosarcoma was induced by administering, to Wistar rats, 80-100 g bodyweight each,  $6 \cdot 10^5$  tumor cell doses. Doses of 1000 IU/kg increased animal longevity only 11 percent in animals infected with La hemocytoblastosis. Treatment of LI0-1 lymphosarcoma showed only a slight decrease in the weight of the spleen of treated animals; the decrease was found to be dependent on amount of enzyme dose given. Applying various l-asparaginas formulations to animals infected with lymphadenosis L5178 in 500 IU/kg doses leads to complete recovery in 60-70 percent of mice. Tables 4; References 12: 1 Russian, 11 Western.

USSR

UDC 616.34-005-022.7(Shigella)

THE INFLUENCE OF SHIGELLA SONNEI ENDOTOXIN ON THE CHOLINERGIC REGULATION OF  
THE INTESTINAL BLOOD CIRCULATION

Moscow BYULLETEN' EKSPERIMENTAL'NOY BIOLOGII I MEDITSINY in Russian No 3,  
Mar 77 signed to press 19 May 76 pp 271-272

GALAGUZA, YU. P., Pathophysiology Laboratory, Kiev Scientific Research Institute  
of Infectious Diseases, Ministry of Health Ukrainian SSR, Kiev

[Abstract] With the aim of studying the mechanisms of blood circulation disruption in the small intestine and the colon during dysentery intoxication, a method of extracorporeal autoperfusion and resistography of the intestinal vessels and synchronous multichannel recording of the systemic blood circulation was applied to the study of the influence of the Sh. sonnei endotoxin on the cholinergic regulation of the cardiovascular system in Macacus rhesus. It was shown that the development of intoxication was accompanied by changes in the cholinergic regulation of the intestinal and systemic circulation leading to its disturbance. It is supposed that affection of the cholinergic control structures and disruption of the circulation determine the development and course of the infection process. References 11: 10 Russian, 1 Western.

## BIOELECTRIC ANALYSIS OF INTRACARDIAC REFLEX REACTIONS UPON ACTIVATION OF CARDIAC RECEPTORS WITH VERATRINE

Moscow BIOLOGICHESKIYE NAUKI in Russian No 4, 1977 signed to press 18 February 76 pp 79-84

GORODETSKAYA, YE. A., DUNINA-BARKOVSKAYA, A. YA., KOPYLOVA, G. N., and UDEL'NOV, M. G.

[Abstract] In an earlier work using the electrophysiological method of recording, the authors showed that extension of the myocardium of the right atrium of an isolated heart causes pulse activity in the effector paths of the intracardiac nervous system, which disappears completely after treatment with ganglioblocking substances and is, consequently, a result of activation of a local reflex arc. Methodological difficulties prevented the use of sufficiently effective irritants in this study. In order to eliminate these difficulties, veratrine was used as a means to increase the functional activity of the receptors in response to the same level of mechanical stimulation. The experiments were performed on the isolated heart of *Rana temporaria* L., the structure of the cardiac nervous system of which facilitates electrophysiological study of the intracardiac nervous apparatus. Application of veratrine to the myocardium of the ventricle or atrium was generally accompanied by a significant increase in the afferentation flux. The effect was concentration dependent. The greatest activating effect was produced by solutions of veratrine with a concentration of  $1 \cdot 10^{-5}$  g/ml. The experimental data indicate that veratrine activates the receptor apparatus of the intracardiac nervous system, apparently by increasing the sensitivity of the mechanoreceptors of the heart to adequate stimulus as well as direct stimulation by the substance. Veratrine can thus be used not only to increase central cardiocardic reflexes, but also to potentiate various intracardiac regulatory influences. References 23: 19 Russian, 4 Western.

USSR

UDC 616.1.27-005.4+618.12-008.331.1]-026.][571.56

ISCHEMIC HEART DISEASE AND ARTERIAL HYPERTENSION IN THE YAKUTSK ASSR (CLINICAL AND EPIDEMIOLOGICAL STUDY)

Moscow KARDIOLOGIYA in Russian No 3, 1977 pp 63-70

PETROV, R. A., deceased, and RYVKIN, I. A., Institute of Cardiology imeni A. L. Myasnikov, Academy of Medical Sciences USSR, Moscow, and Yakutsk University

[Abstract] A total of 1003 men age 50 to 59 years, including 503 nonindigenous residents of Yakutsk, mostly Russians who had been living in the Yakutsk ASSR for at least 10 years, were examined with a view to determining the incidence of ischemic heart disease and hypertension. The results of 4650 autopsies were also taken into account. Ischemic heart disease was found somewhat more often among the Russians than among the nonindigenous population and in the latter the painless form of the disease was twice as common. Arterial hypertension was almost twice as common among the natives engaged in physical labor as among the Russians, and the incidence of the disease was high even in the rural population. According to autopsy findings, chronic glomerulonephritis was 5 times and chronic pyelonephritis twice as frequent among the natives as among the Russians. The differences in incidence of ischemic heart disease and hypertension between the 2 population groups are tentatively ascribed to the high concentrations of mineral salts present in the republic's lakes and streams. While these salts inhibit the development of atherosclerosis, they also promote the deposition of concrements in the urinary tract and resulting symptomatic hypertension. Tables 2; References 20 (Russian).

USSR

UDC 616.13-004.6-036.21(47-01)

STUDY OF ATHEROSCLEROSIS IN DIFFERENT GEOGRAPHIC ZONES OF THE SOVIET UNION.  
III. FATTY ACID COMPOSITION OF SERUM LIPID FRACTIONS IN RESIDENTS OF TASHKENT

Moscow KARDIOLOGIYA in Russian No 3, 1977 pp 59-62

APTEKAR', S. G., VIKHERT, A. M., MININA, A. V., and ABRAROV, A. A., Institute of Cardiology imeni A. L. Myasnikov, Academy of Medical Sciences USSR, Moscow, and Uzbek Institute of Hematology and Blood Transfusion, Tashkent

[Abstract] The composition of fatty acids in triglycerides and serum cholesterol esters was analyzed in 90 healthy Russians and Uzbeks age 20 to 50 years living in the city of Tashkent. The linoleic acid content of the triglyceride fraction was found to be substantially higher in the native Uzbeks than in the Russians, 24.8 and 18.4%, respectively, probably because the former consume large quantities of cottonseed oil which is rich in linoleic acid. The linoleic acid fraction of serum cholesterol esters decreases with age while the palmitic and oleic acid fractions increase.

The relative content of linoleic acid in the cholesterol ester fraction is somewhat higher in Uzbeks age 20 to 29 than in Russians of the same age. A comparison of the fatty acid composition of serum triglycerides with that of the same lipid fraction in the vascular wall revealed that the ratio of linoleic acid in serum to that in the intima of the aorta is approximately the same in the 2 population groups. Tables 4; References 16: 6 Russian, 10 Western.

## Therapy

USSR

UDC 616-001:17

### REHABILITATION AFTER SEVERE BURNS

Frunze ZDRAVOOKHRANENIYE KIRGIZII in Russian No 1, 1977 pp 39-42

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[Abstract] During the 8-year existence of the Burn Section, 3632 persons were treated for burns; 1464 (627 children and 837 adults) underwent plastic surgery. Deep burns were suffered by 748 persons. These burns included third degree burns to 10 percent of the body surface in 382 persons, from 10-14 percent in 146, 15- to 19-percent in 79, 20- to 29-percent in 91, 30- to 39-percent in 38, 40- to 59-percent in 8 and 60- to 75-percent of the body surface in four persons. Complex therapy of deep burns include timely first aid upon injury and during transportation to the hospital, while in the regional hospital, and, finally, in the specialized hospital. Shock prevention is critical as is transfusion therapy to prevent kidney damage. Therapy of deep burns includes plastic surgery of injured area within 2-2 1/2 months after injury, daily blood transfusion and introduction of protein solution with direct transfusion to prevent anemia, to increase body resistance, and to improve blood circulation and microcirculation in kidneys. Injured extremities are immobilized in a position of hyper-correction no later than 2-2 1/2 months after injury. Injured joints are fixated in functionally useful positions. Such complex therapy permitted 135 to 188 adults treated to return to work, 6 became invalids and 45 had limited capacity to work.

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### HISTOCHEMICAL ANALYSIS OF KEY ENZYMES OF THE REDOX PROCESSES IN SKIN TO WHICH NAFTALAN PETROLEUM HAS BEEN APPLIED

Baku AZERBAYDZHANSKIY MEDITSINSKIY ZHURNAL in Russian No 2, 1977 pp 7-13

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[Abstract] Naftalan petroleum, a therapeutically active substance widely used in dermatology and other branches of medicine, was applied daily for 20 minutes to small patches of skin of adult white rats at the rate of 0.1 ml/100 g of animal weight. Skin sections were examined histochemically after 1 to 15 applications and then 10 and 15 days after the last one to determine the activity of several enzymes: lactate dehydrogenase, glucose 6-phosphate dehydrogenase, succinic dehydrogenase, NAD and NADP diaphorases. The application of Naftalan petroleum to the skin stimulated the activity of all the enzymes studied. The degree of activity steadily progressed in relation to the number of applications and usually reached a peak after 7 to 10

applications. It remained high until 15 days after the last application when it returned to normal levels. Enzymic activity was high in all the nucleated cells, including the prickle and granular cells of the stratum germinativum of the epidermis. References 4 (Russian).

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576.858.9.036.8

COMPARATIVE EVALUATION OF THE EFFICACY OF ANTIBIOTIC AND BACTERIOPHAGE  
THERAPY OF ACUTE SUPPURATIVE PLEURISY IN PENETRATING CHEST WOUNDS UNDER  
EXPERIMENTAL CONDITIONS

Moscow GRUDNAYA KHIRURGIYA in Russian No 2, 1977 pp 85-88

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[Abstract] Dogs were injured, infected with virulent strains of streptococci and staphylococci, and then treated with antibiotics (monomycin, ecmonovocillin) alone, specific bacteriophage alone, or antibiotics combined with bacteriophage. The course of the infection was most severe in the animals that received only the antibiotics and improvement did not set in until days 7 to 10. The animals treated with bacteriophage alone did not begin to show marked improvement until day 7. However, the animals that received a combination of antibiotics and bacteriophage showed almost no signs of the disease by day 3. The results were best when the antibiotics were injected intrapleurally or intramuscularly and the bacteriophage intravenously. Preliminary administration of an anti-histaminic completely prevented anaphylaxis. Figures 3; References 12 (Russian).

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EXPERIMENTAL STUDY OF THE EFFECTIVENESS OF MK-6 CYANACRYLATE GLUE AS A MEANS  
OF PREVENTING ARROSIVE HEMORRHAGES IN VASCULAR SURGERY

Moscow GRUDNAYA KHIRURGIYA in Russian No 2, 1977 pp 72-75

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[Abstract] The results of 3 series of experiments on 80 dogs showed that treating a vascular suture with MK-6 cyanacrylate glue and reinforcing the site with a fascial cuff greatly reduced the incidence of hemorrhages despite suppuration of the postoperative wound produced by deliberate



infection with staphylococci, whereas hemorrhages developed in half the control animals due to liquefaction of the vascular wall and loosening of the hermetic seal of the suture. Histological examination showed that the glue film separated the vascular suture from the purulent focus, thereby preventing microorganisms, enzymes, and other injurious factors from coming into direct contact with the suture and adjacent portions of the arterial wall. As a result, the destructive changes under the film were not as pronounced as in the experiments without it. Figures 3; References 13: 9 Russian, 4 Western.

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SOME ASPECTS OF THE PATHOGENESIS AND CLINICAL PICTURE OF CHRONIC VENOUS INSUFFICIENCY OF THE LEGS AFTER DEEP BURNS

Leningrad VESTNIK KHIRURGII in Russian No 3, 1977 pp 19-23

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[Abstract] Of 66 patients who suffered deep burns, chronic venous insufficiency developed as a result of varicosis under skin grafts in 46, postphlebitic syndrome in 14, and cicatricial compression in 6. Ulcers usually formed early, frequently before the veins became dilated. Mechanical obstruction to the flow of blood and lymph at the level of the scar was manifested by pain, pronounced edema, trophic ulcers and, in some cases, secondary elephantiasis. Figures 3; Table 1; No references.

II. BEHAVIORAL SCIENCES  
Engineering Psychology & Ergonomics

USSR

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LABOR OF WORKERS OF THE MAINTENANCE AND ADJUSTMENT SERVICE IN MACHINEBUILDING  
MANUFACTURE FROM THE VIEWPOINT OF PHYSIOLOGY AND HYGIENE

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 5, 1977  
signed to press 20 Feb 76 pp 46-47

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[Abstract] In present-day machine building expenditure of labor in basic production is 48% positioning and 40% servicing. The number of electricians, fitters-maintenance workers, and adjusters in fully-automated industries reaches up to 80% of all the workers. The maintenance-adjustment work involves variegated operations, the majority of which are executed manually with a monkey wrench, hammer, and similar tools. Adjustment work takes up 31.8% of the time, work of mechanics and electricians 7.8-13.5%. The physical manipulations and working conditions were examined in 9 motorcycle factories. Labor of the maintenance and adjustment service was judged essentially mechanical-manual with predominance of hand operations, and classified as of medium to difficult work. Labor conditions of these maintenance-adjustment workers is more favorable than workers in basic occupations thanks to lower intensity and shorter duration of action of individual hygiene factors. This favorably distinguishes them from those conditions in the chemical, petroleum and petrochemical industry in which the work must be done under conditions worse than in the basic occupations. Maximum improvement of conditions for the maintenance jobs is suggested. Table 1; References 3 (Russian).

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PSYCHOPHYSIOLOGICAL CRITERIA AND METHODOLOGY FOR OCCUPATIONAL SELECTION OF  
MOTOR VEHICLE DRIVERS

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 5, 1977.  
signed to press 21 Jul 76 pp 24-27

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[Abstract] Little has been done up to now in driver selection, largely because of the constant shortage of driver personnel and absence of simple and reliable screening tests which can be used in polyclinics and in medical points. The present report sought to find criteria for unsuitability for driving jobs and to develop a procedure to determine these criteria for exploitation by medical commissions who inspect candidates for driving occupations. Trainees at the Central Republic Autocombine (Kiev), aged 17-30, 175 in all, were subjected to a method to determine mobility of the nervous processes. This method is derived from A. Ye. Khil'chenko (Zh. vyssh. nervn. deyat. No 6, 1958, pp 945-948); it was supplemented by EKG recordings by the method of L. A. Butchenko (Fiziol. zhur. SSSR, No 6, 1955, pp 834-837) for 2 min at rest, then for 2 min while performing mental tasks--based on Khil'chenko or on the Shul'te table. The mental load of Khil'chenko was to respond to flashed signals with physical reactions as previously instructed; Shul'te's table involved identifying five missing numbers in 1 to 30 red numbers or in 1 to 29 black numbers within a limited time. Individuals with a low level of mobility of nervous processes are said to be unfit to be drivers. The EKG identified the pulse rate shift during the two minutes of the mental load. A shift of 11-12 percent reveals the candidate to be unfit. Table 3; References 5 (Russian).

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